

BITS

computing & communications news

SEPTEMBER 1996

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY

The New Mexico Supercomputing Challenge, now in its seventh year, will begin its academic-year-long program next month. The Challenge provides high school students and their teachers with instruction from highly skilled computer professionals as well as hands-on experience using world-class computing facilities. Students also compete in a Challenge logo contest. This year's winning logo (right) was created by students from Kirtland Central High School in Farmington, New Mexico. The Challenge is sponsored by CIC Division in partnership with other laboratories, businesses, and universities in New Mexico. For details, see the article on page 4.



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CIC Customer Service Center(505) 665-4444 or cichelp@lanl.gov

Integrated Computing Network (ICN)

Consulting:

Centralized scientific and engineering computingconsult@lanl.gov or 7-5746

Lab-wide administrative and business systems.....labwide@lanl.gov or 7-9444

Passwords (required for access to ICN)validate@lanl.gov or 5-1805

Central Computing Facility (CCF)7-4584

Advanced Computing Laboratory (ACL)5-4530

Desktop Support Center (DSC)7-4357 (7-HELP)

For PC questions: PC-help@lanl.gov or 7-9372

For Macintosh questions: Mac-help@lanl.gov or 5-1361

For UNIX questions: UNIX-help@lanl.gov or 5-2220

For groups with CIC-2 support contracts: 5-2220

Telephone Services Center7-3400

(includes voice mail)

Computer training

Lab-wide systems support training7-9444

Computer/workstation training7-9399

Personal computer training7-9071

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CIC Implements New Recharge Processing System

On October 1, 1996, CIC Division will begin using a new system to process recharge for its worker machines (i.e., the Crays, Clusters, and Connection Machines). Eventually, recharge for all CIC product lines will be processed using the new system. While the new system will provide more accurate and efficient processing of recharge, it may also present some significant changes in the way users manage their use of the worker machines. This article will explain what those changes will be.

The Client/Server Application

Under the old system, charge codes were processed by each worker machine, and each machine had its own method for doing so. This inconsistency often led to confusion about how the recharge system actually worked. The new system eliminates this problem by using a client/server application that will "front-end" all the worker machines, providing a consistent method for recharge processing. This means that users will no longer enter or modify charge codes via the individual worker machines. Instead, users will enter or modify charge codes via the client/server application.

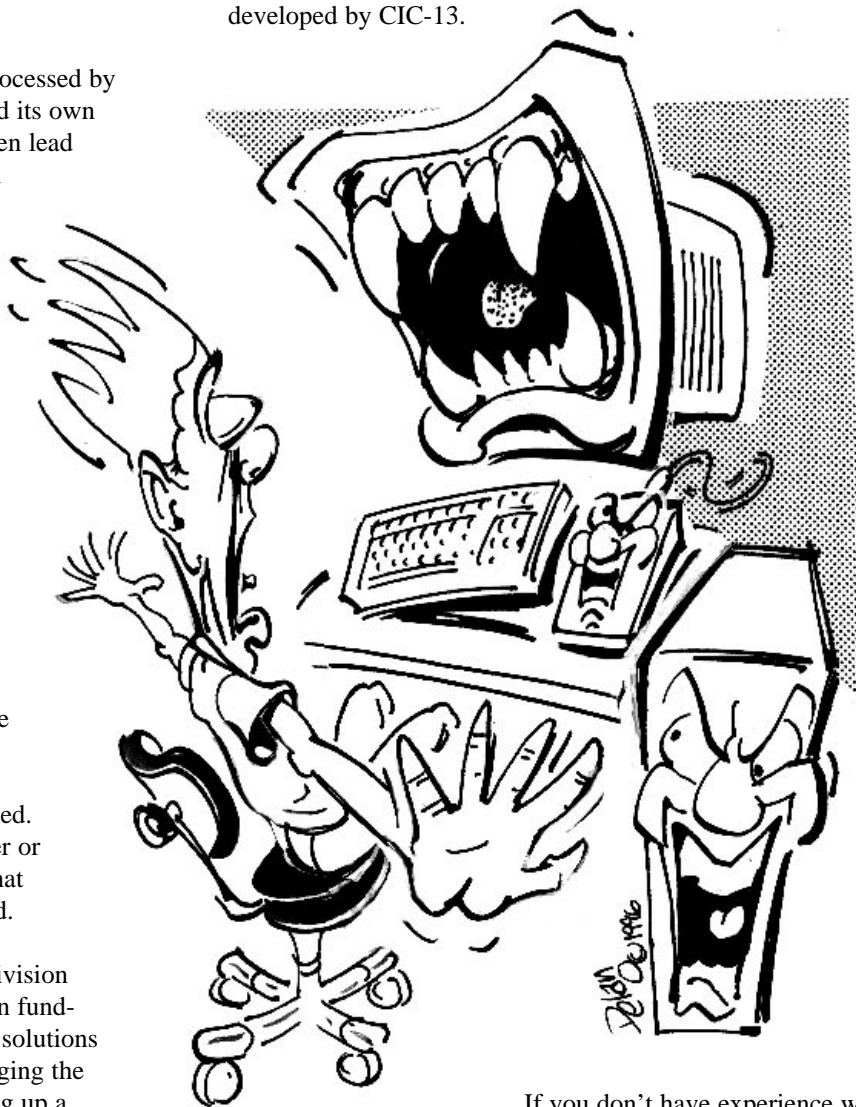
Verification of Charge Codes

The new system will vastly improve the verification of charge codes. Here's how it works. User charge codes will be verified upon entry and each night at midnight. If the system approves the charge code, access to machine usage is provided. However, if the charge code is not valid, access will be denied. If this happens, the system will send the user or users denied access an e-mail explaining what happened and how access can be established.

Charge codes become invalid when BUS Division terminates the code for some reason or when funding for the code has run out. Some possible solutions for rectifying this situation include (1) changing the charge code specified for the user, (2) setting up a default/alternate charge code for anyone using the unfunded charge code, or (3) having the appropriate Business Team Leader put more allocations into the unfunded charge code. Once the user has established a valid charge code, access can be provided throughout the day with a 30-minute turnaround time.

Getting and Using the System

The client/server application, developed by CIC-13, will be available through CIC-2's Electronic Software Distribution site (<http://www-cic2.lanl.gov/esd>). It is currently available for PC and Mac platforms (unfortunately, a UNIX version is not available at this time), and the client portion can be easily downloaded to your local machine. This system has a look and feel that is similar to other Labwide Systems developed by CIC-13.



If you don't have experience with any of these systems, you may want to consult your group secretary who probably has experience downloading and using Labwide Applications. Training for this new system is also available. For details, please call the CIC-6 Training, Development, and Coordination Team at 667-9559.

Usage Statistics

Usage statistics for the worker machines, and subsequent product lines as they are converted, are available through CIC-13's DataWarehouse. This means that using AutoSum for worker machine usage statistics will no longer be available. Most group offices are currently using the DataWarehouse for financial information, so this application should be available. The usage statistics developed with DataWarehouse will be similar to the old reports. Additional information, or "drill-downs," for the usage data and the actual voucher/financial statements will also be available.

Many of the usage statistic reports will also be available via the Web. Access via the Web is scheduled to be implemented in November of this year. Watch for information regarding exactly when and where these reports will be available. Plans are also being made for converting the client/server portion to a Web-based product sometime in FY97.

Full Implementation of the System

Other product lines will soon be converted to the new system. Many of them (e.g., CFS, Pages, HPSS, Networking, and Phones) will soon begin feeding data into the new system. We hope to be fully converted by the first quarter of the 1997. Our strategic goal is to bring all CIC recharge functions into the new system, providing one-stop shopping for all CIC customers.

This new system has been running parallel to the old system and the results have been remarkably good! If you have questions or concerns, or want more information, please contact one of the authors listed below.

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Computer Sleuths Hunt for Medicare Bandits

Los Alamos is using modern computer science techniques to develop automated methods for detecting and preventing fraud, waste, and abuse of Medicare services. The Laboratory is working under a two-year contract with the Health Care Financing Administration of the U.S. Health and Human Services Department.

HCFA, which administers the Medicare program, processes more than 800 million Medicare claims a year—expected to grow to about 1 billion by 2000—worth roughly \$180 billion. The organization needs to become more efficient in processing claims, and at the same time more effective at detecting, preventing, and prosecuting Medicare fraud, waste, and abuse.

The goal of this project is to produce new algorithms that HCFA can implement in a prepayment process to score Medicare claims for suspiciousness. Examination of highly suspect claims can then determine whether they should be further processed, suspended pending further analysis, or denied before they are paid.

The business of processing and paying Medicare claims is handled by as many as 79 different private contractors. These contractors operate independently to receive claims from health care providers, process the claims, decide whether the claims are appropriate, pay the claims, and then ask HCFA for reimbursement.

HCFA maintains numerous databases containing billions of claims, adding up to many trillion bits of information. This information could help spot fraudulent claims, but the agency's multiple computer systems make it difficult to pull together all these databases. Information in the databases about patients, physicians, medical groups, health maintenance organizations, third-party Medicare providers or insurance companies often is organized in different ways.

Los Alamos scientists are using supercomputers to help the agency and private vendors combine diverse software systems into one data bank and look for patterns that cut across all the databases.

Part of Los Alamos' goal is to develop a thorough understanding of the existing computer systems that contain Medicare data, look for weaknesses in those systems and the software that maintains their security, and suggest improvements.

Much of the project builds on Los Alamos' experience in examining vast amounts of data stored in many different formats, and recognizing patterns or spotting anomalies in such data. That work includes organizing nuclear weapons design and testing information into simulations and seeking patterns in satellite data or export records that might indicate proliferation of weapons of mass destruction.

When HCFA processes a claim from a contractor, it uses a system of specific computer codes called "edits" that look for obvious inconsistencies within the claim. For instance, if the claim is for brain surgery, the edit makes sure it didn't originate with a podiatrist.

The Medicare claims system and the computerized edits have grown up over the past 30 years. Each edit performs a specific operation, but as new edits are developed, they are patched on top of older ones, often increasing the inefficiency of the system.

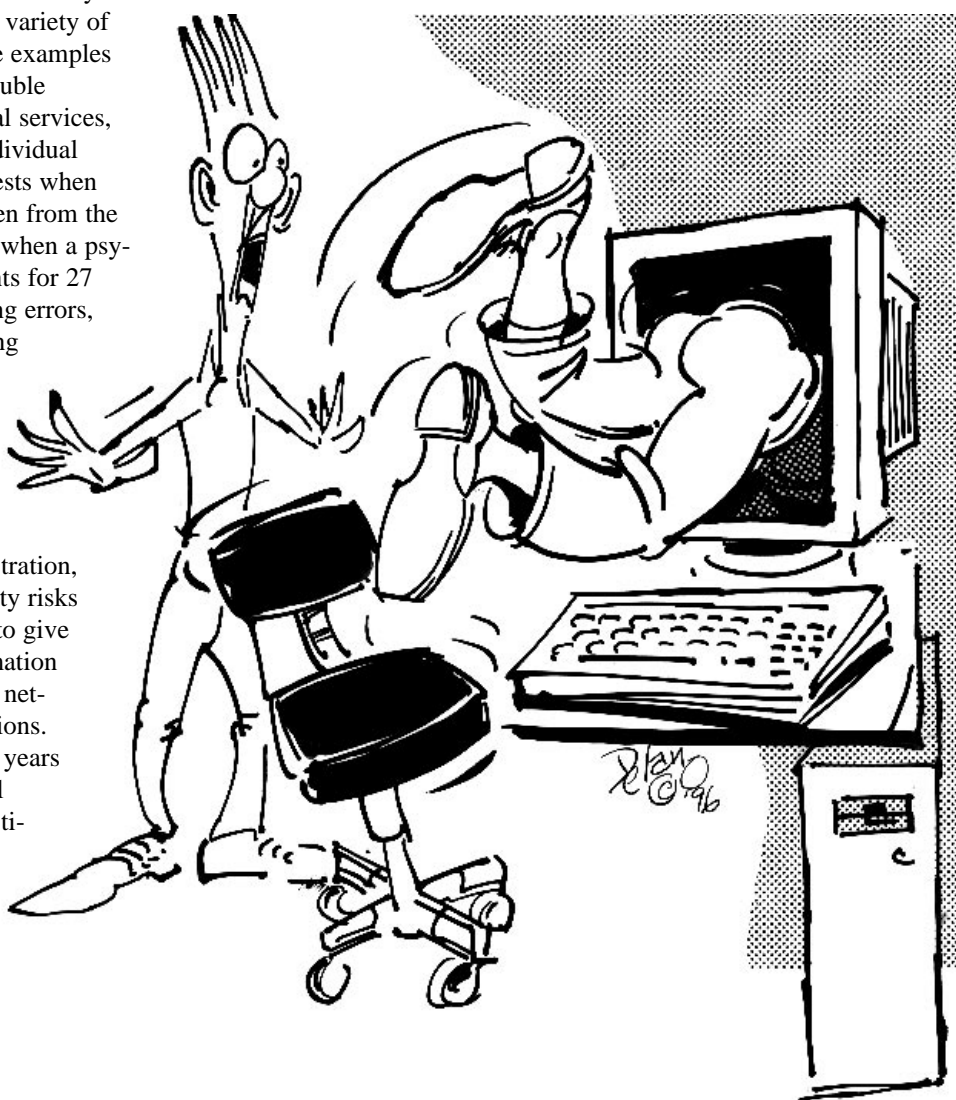
HCFA and Los Alamos hope the new system can be designed to detect a variety of anomalies systematically. Some examples include simple mistakes like double billing; "unbundling" of medical services, such as a clinic that submits individual charges for 37 separate blood tests when only one blood sample was taken from the patient; obvious overbilling, as when a psychiatrist claims he's seen patients for 27 hours in a single day; and coding errors, such as a neurosurgeon operating on an ingrown toenail.

Los Alamos computer scientists have extensive experience in fraud detection. In a recently completed project for the Social Security Administration, they researched potential security risks involved in a proposed system to give clients access to account information via public kiosks and computer networks, and recommended solutions. They also have worked for two years on a project that helped Internal Revenue Service criminal investigators develop new ways to detect fraud in electronically filed tax returns.

Other Los Alamos projects relevant to Medicare fraud include a multi-year, multimillion-dollar agreement with Citicorp to develop credit management and fraud detection tools; a contract with MasterCard International to detect credit card fraud; and various efforts with government and private industry in anomaly detection, data management, and computer security.

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Reprinted from Dateline (July 1996)



Challenge to Start Seventh Year

High School students and teachers are now registering for the seventh annual New Mexico High School Supercomputing Challenge which will begin late this month. Last year over 800 students and teachers registered for the event, and the participation grows each year. Over the course of the first six years the Challenge has reached 3300 students and teachers and we estimate that the Challenge will reach over 6000 students by the year 2000.

The Challenge is an exciting competition open to all high school students in any public, private, home, or parochial school in New Mexico. There are no eligibility requirements for a student to participate, and the Challenge is offered at no cost to the school or school district. This academic-year-long program allows teams of students the opportunity to do computational science projects of their own choosing using high-performance computers.

From their schools, students use the New Mexico Technet computing network to access computers at Los Alamos National Laboratory (LANL). The Challenge is a joint program with sponsors from several universities, businesses, and laboratories in New Mexico.

The 1996-97 Challenge will begin with a Kickoff Conference at the Glorieta Baptist Conference Center during the last week of October. Participants will receive instruction and hands-on lab time in programming languages (Fortran-90 and C++), UNIX, the Internet, HyperText Markup Language (HTML), National Education Supercomputing Program (NESP), teamwork, and project design and refinement.

In November and December, Challenge staff will visit each registered high school to ensure that all telecommunications equipment at the schools is working and that all students have access to the supercomputers here at LANL.

In January, Challenge staff will hold one-day regional workshops in Portales, Las Cruces, Socorro, Santa Fe, Albuquerque, and Gallup. During these workshops students will work on programming problems with their teams and will compete for the "Regional Hot Shots" award by asking and answering computer related questions.

In February students attend a preliminary judging session where they present the progress of their project to date to a small panel of judges. Judges then respond to the participants with their reaction to the project and with suggestions to help students complete their project by the deadline.

Each team submits a final report in early April. Twenty-five judges selected from national laboratories, industry, and academia then review all projects and make suggestions for

finalist teams. During a conference call in mid-April judges decide on 10-15 teams to invite to final judging, which is held in Los Alamos in late April.

The Awards Day festivities are held each year at LANL. Finalist students are invited to present their completed project to the judges and all participants are invited to attend the Awards Day activities at the end of April where many LANL employees give them tours, talks, and demonstrations. At the ceremony, prizes, scholarships, and awards are given out to the winning students. First and second place prizes include a Pentium computer for the team's school and savings bonds for the students.

The quality of science education in New Mexico has improved as a result of the Challenge. During the past two summers, workshops have been held for teachers of Challenge teams to help them better instruct their students in computational science. During this two-week training session teachers studied C++ programming, UNIX, HTML, NESP, and Internet/WWW, and they received graduate credit from hosting universities (UNM, NMSU, and ENMU). We have also seen many new computer science classes offered at many high schools around the state.

As an educational experience and a competition, the Challenge is unique because it is open to all high school students in the state of New Mexico and there is no cost to participate. One goal of the Challenge is to transfer computing technology to the schools in New Mexico. The Laboratory is reaching out to New Mexico to be a good neighbor. Other states have shown interest in starting a Challenge and have been advised on how to replicate the Challenge in their areas. The Challenge has also provided a way to recruit future scientists from the many bright students here in New Mexico.

We are always looking for volunteers to help in the different phases of the Challenge, including instructors for the kickoff conference in Glorieta, project advisors to serve during the year, and speakers and escorts for the Awards Day activities. If you would like to help and become involved with high school students and their teachers from around New Mexico, please contact us. We would be happy send you a hard copy of the five-year report about the Challenge, or you can check out the Challenge Web page at

<http://education.lanl.gov/sep/programs/nmscc.html>

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Finding Phone Numbers and Addresses via the Web

The Research Library (CIC-14) has added a list of links to its home page (<http://lib-www.lanl.gov>) that provide access to various on-line phone books. This list can be found at

<http://lib-www.lanl.gov/infores/address.htm>

Or look under CIC-14's Information Resources by Subject (<http://lib-www.lanl.gov/infores/>). Many of these directories include both personal and business phone numbers and addresses. Some also link to maps that give specific locations. Some sites only include businesses that have submitted information. You may need to try several directories to get the one you need. Be aware that all phone numbers and addresses are not on-line, and that what numbers are listed may not be current.

We also offer a half-hour class called "Finding Addresses and Phone Numbers on the WWW." To register for this class, contact the Library Service Desk (library@lanl.gov or 667-5809).

Here are some tips we developed for searching these resources:

- Watch out for abbreviations. "Smith, John" may be entered as "Smith J," so try variations of spelling.
- Many of these on-line resources come from "published" directories, so some information is not always accurate or updated. Also, unlisted phone numbers should not appear.

- In keyword searching, try not to use "generic" words like American, Association, Society, or International. Whenever possible use more unique words. For example, instead of searching American Mugwump Company, search Mugwump. However, the University of Podunk will likely be listed under University, not under Podunk.
- If you need the math department at Podunk University, but all you can find is their chemistry department, check the bottom of the page. This is where most pages link back to their home page.
- Links to some organizations can be found by using our Information Resources by Subject page, which is referenced above.
- Use Web search engines to find home pages for other organizations (<http://www.lanl.gov/Internal/finding-info.html>).
- Use our U. S. Government Resources page to locate various agencies and sub-agencies (<http://lib-www.lanl.gov/infores/govt.htm>).

If you are having trouble locating an address or phone number, please contact the Library Service Desk (library@lanl.gov or 667-5809) because we have many other resources available.

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OAG Service Announcement

Due to the high cost of maintaining our link with the OAG (On-line Airline Guide) and the availability of numerous OAG-type services via the World Wide Web, LANL access to the OAG (on-line version) will be terminated COB Monday, September 30, 1996.

Listed in Table 1 are some of the many Web sites that offer services similar to the OAG. Table 2 contains URLs for the home pages of some major airlines. We also have a Web page that has links to all of the items in Tables 1 and 2. You can access this page from the LANL home page by selecting "Info by Subject" and then "Airline Guides," or enter the following URL:

<http://www.cic-5.lanl.gov/~rlb/oag1>

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Table 1. OAG-Type Sites

Instant Air—<http://www.instantair.com>
CEL Corp—<http://www.celcorp.com/sabre/sabrehome.html>
System One—<http://www.sys1.com/trip/flights/flight.htm>
Internet Travel Network—<http://www.itn.net/cgi/get?itn/index>
Travelocity—<http://www.travelocity.com>
PC Travel—<http://www.pctravel.com>

Table 2. Airline Home Pages

American—<http://www.americanair.com>
America West—<http://www.americawest.com>
Continental—<http://www.delta-air.com/index.html>
Delta—<http://www.flycontinental.com:80/index.html>
Southwest—<http://www.iflyswa.com>
TWA—<http://www.twa.com>
United—http://www.ual.com/united_bin/home_bin/home.cgi

Images on the Web: More Tips

The “Big Sky” theory of flying goes something like this: The sky is so big that there’s plenty of room for all the planes, so why should we bother looking out for each other? It’s the kind of phrase you hear one pilot use to describe another who has just darted in from nowhere, passing so close you can read the serial numbers on the other plane’s rivets.

Sometimes it seems the Web invites a Big Sky attitude of its own. After all, the Web is big, encompassing something more than 50 million pages, brimming with information on anything from the latest P-25 subatomic physics experiments to old ways to skin a dead cat.

The attitude can be encouraged when we are working on our own Web site, since we frequently enjoy the advantages of a fast connection and at least some degree of dedicated service from the server machine. This is especially true if we are working on our own desktop machine, where we don’t have to share resources with anyone else and even the largest graphics load quickly.

Unlike the sky, though, the Web is full of collisions. Attitudes, expectations, and attempts to simultaneously access resources collide just like the little electronic packets of information that are flying through the wires. Things are such an inescapable mess that the Internet Protocol (IP), the basis of all the Web’s communications, includes a “time to live” with each packet, so that the packet can be smart enough to politely kill itself and get out of the way if it gets lost out in the ether. (One side effect of this is that your machine also knows to re-request a packet if it hasn’t arrived during its time to live, which means that most of the time when packets get lost you’re not likely to notice anything other than a delay.)

Potential bottlenecks abound and vary depending upon the time of day, the state of various machines, the availability of lines,

and more. Sometimes Singapore will be unreachable; other times it’ll come up faster than the machine around the corner.

Whatever the bottleneck of the moment may be, however, the basic strategy for achieving good performance from a Web site remains the same: Send only what is needed, and send it as cleanly as possible.

Outlined below are a few tips and tricks for helping a Web site’s performance. The focus, like last month, is on effective ways to use graphics. As in previous BITS articles about the Web, no attempt is made to be comprehensive. Instead, these are just a few practical, easily implemented suggestions that can help.

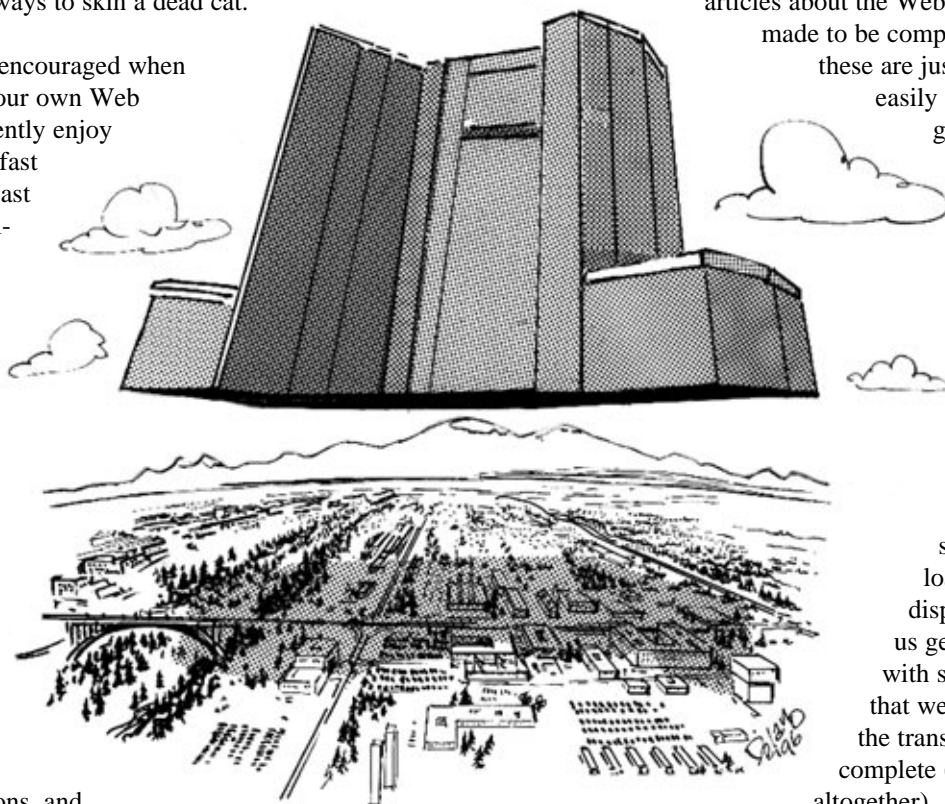
Use All (but Only) What You Need

Graphics will always slow things down—there’s no escaping it.

Even the smallest image will take some time to download, decode, and display. A number of us get impatient enough with slow-loading pages that we’ll simply interrupt the transfer before it’s complete (or turn off images altogether).

Having said that, there are plenty of things graphics can do well that simple text cannot. A logo can establish and reinforce a sense of identity. Backgrounds can add texture and a “sense of place” to pages. Buttons can call people’s attention to available options. Bar charts can summarize data in an easily understood manner. When used effectively, graphics can create an overall impression of professionalism and competence.

But “effectively” does not mean “indiscriminately.” All too often we see overkill—graphics for graphics’ sake that accomplish nothing more than slowing down the page, clogging up the machines and networks, and frustrating the user.



Before using any graphic, we should first determine its purpose. If we can't establish a defensible purpose ("because it's nifty," isn't good enough), then we're better off not using it. Restraint can go a long way toward maintaining good relations with users and system administrators. If we can establish a purpose, though, then we should feel free to take advantage of graphics' strengths.

Note: Although this article does not directly address animations or audio, the above section applies to them just as much as to static graphics.

Take Advantage of Browser Cache

The easiest way to insert an image into a document is to have the image file in the same directory as the document. Using the code `` is easier than using ``. The problem we sometimes encounter is when somebody goes to a different directory and again uses `` to load a different copy of the same image. The browser doesn't know the image is the same, so it repeats the whole process of downloading, decoding, and displaying the image.

We can easily improve the Web site's performance by taking advantage of the browser's cache (the place on the local machine where it stores a copy of things it has recently opened). If we put all of our frequently used graphics in a single, separate directory (say, /graphics), then every page that uses them will use the same copy, and the browser won't need to repeat the downloading process. Furthermore, if we use full path names (e.g., ``), then we can move the document wherever we want in our site without needing to update the reference.

Among the very many sites that take advantage of this is Alta Vista (<http://altavista.digital.com/>). When you first reach the site, there is a delay while the navigation banner at the top of the page is downloaded. When you go to other pages that use the same banner, though, the banner is displayed without delay (though it may still take some time for the rest of the page to load).

Image Sizing (again)

In last month's BITS, I briefly mentioned that images can get distorted if the browser resizes them. There's also a performance issue involved.

Using the example from last month, let's say we use the following HTML code to display an image:

```
<IMG WIDTH=200 HEIGHT=100 SRC="filename.gif">
```

In this example, "filename.gif" will be sized to 200x100 pixels, regardless of its actual size. This is good if we're letting the browser know what size the image is so that it can correctly lay out the page before the image itself has been downloaded, but it's not good if we're using it to change the size of the image.

If, for instance, we build a 4KB file that is 200x100 pixels, what gets displayed by the browser will be close to what we see in our image editor (though not quite the same). If, however, we're using an image that is 400x200 pixels, then we'll have a file size closer to 16KB. It'll take roughly four times as long to download, four times as long for the browser to decode, and some amount of additional time for the browser to resize (which it doesn't have to do at all if the image size matches the WIDTH and HEIGHT). To top all that off, we don't have any control over what the browser will do to reduce the size, which can lead to fuzziness, distortions, illegibility, and strange colors.

For a good example of a site that consistently uses WIDTH and HEIGHT effectively, check out CNN (<http://www.cnn.com>). The site is fairly heavy on graphics, but the pages format quickly with correctly sized spaces for the images to fill in, and the images consistently match the size they are assigned. (With Netscape, look under View/Document Source to see the page's HTML code, and under View/Document Info to see the image's true sizes.)

Thumbnails

Thumbnails are small, faster-loading copies of larger images used to give users a preview so that they can decide whether they want to take the time to download the whole image. Frequently, the thumbnail itself will be hot-linked so that the users can click on it for the larger version.

To create a thumbnail, open the original image in your graphics editor and resize it or resample it down to 150 or so pixels wide. A few tips:

- Resampling (which interpolates to smooth out rough spots) is generally better for realistic, truecolor images such as photographs (the same types of images that JPEG/JFIF is well suited to). Resizing (which simply deletes pixels) is generally better for simple, palette-based images with sharp transitions between colors (the same types that GIF is well suited to).
- If the original image is in JPEG/JFIF or another truecolor format, consider saving the thumbnail in JPEG/JFIF with an increased compression ratio. Image quality isn't the objective; a small image file size is.

- Consider grayscaling the thumbnails for truecolor images. If there is adequate contrast in the image, a grayscaled thumbnail might show adequate detail.
- Some image editors (LViewPro, etc.) allow you to convert images to thumbnails in batch. This approach can be useful for most images, and you can always go back and individually create new thumbnails for any images that need special attention.
- Although the underlying image can be in any format you choose (since it does not necessarily need to be viewed by the browser), the thumbnails should be viewable in-line. Currently, this means either JPEG/JFIF or GIF formats.

There are several ways to hot-link thumbnails to the source images, the easiest being a simple HREF hypertext reference:

```
<A HREF="image.jpg"><IMG SRC="thumbnail.jpg"></A>
```

Imagemaps can also be used if a number of thumbnails are combined into a single, large graphic, but the added complexity is rarely needed.

It is also frequently helpful to include a notice of the image size and format (e.g., "64 KB JPEG). This warns users what they're about to get and how long it might take to download—which can affect their decision about whether to download it now or come back later when services might be faster.

For a good example of an effective use of thumbnails, see the Hubble Space Telescope Public Pictures at

<http://www.stsci.edu/pubinfo/Pictures.html>

That site is chock full of large, good-quality photographs, but a liberal use of hot-linked thumbnails keeps the site manageable. (As of this writing, the site would be even better if it included notifications about file sizes and took advantage of the WIDTH and HEIGHT attributes, but this is counterbalanced by the informative captions and the overall quality of the images. As always, content conquers all.)

More Information

For more information about Web graphics, please refer to "Images on the Web: Some Tips" (BITS, August 1996), "Creating Effective Web Page Backgrounds" (BITS, April 1996), and the Information Architecture White Paper IA-6801: Electronic Image Formats and Compression Algorithms. (Please refer to the IA Web space at <http://www.lanl.gov/projects/ia/> for the location and current status of IA-6801.)

For information about other areas being addressed by the IA Project, please visit the IA home page at

<http://www.lanl.gov/projects/ia/>

or look under "What's New" from the Laboratory home page. If you would like printed or e-mail copies of any of the IA materials, please contact Tad Lane at the address given below.



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Four Macintosh Shareware Programs That Will Make Scientists Happy

Shareware programs often start as a nagging little problem in the back of one's mind. Most of the time the resulting application is crude, but just as often the final program becomes a staple in the computing environment. Little applications like Eudora become mega-commercial giants. Handy utilities such as Window Shade, Super Clock, and nested Apple menus have been incorporated into the Macintosh Operating System.

Many of us routinely use these little gems. There are a host of Macs around the Lab that support Fetch, FreePPP, and StuffIt Expander. This article will list four additional shareware applications and utilities that I, personally, find indispensable. The scientist that interfaces between her Mac and other machines will find many of these utilities quite helpful.

I would like to start with a disclaimer. These programs are not LANL IA standards and are not fully supported by the various LANL help desks. If you have general questions about these programs, please call me at the telephone number listed at the end of this article.

All of these programs are for the Macintosh only. I would suspect that there are comparable applications available for PC machines. Why did I write about Macintosh only? "Write about what you know!"

I highly recommend the Web site, <http://www.shareware.com>, for a complete listing of shareware programs on all platforms. All of the programs reviewed in this article can be found there or at the original addresses supplied in this article.

Shareware often comes as is. In other words, there is little or no support for the program. Read the documentation, if any, and play with the software. If you see any conflicts, or just plain don't like the software, delete it from your machine. Be sure to delete any related control panels, system extensions, and preference files along with the program.

A note about shareware and viruses: Most major shareware distributors (like shareware.com mentioned above) will

screen "uploads" for viruses and Trojan horses before they release the programs to the public. I recommend that you only obtain shareware from reliable sources and screen them yourself with a virus checker. The latest version of Virex will scan programs automatically when you download them from the Internet. The four programs mentioned in this article are standards in the Mac community and are virus free.

Flash-It!

This program is a control panel that allows you to capture screen images. Apple allows for a total screen dump, but the resulting image is large and has lousy resolution. Flash-It allows the user to select the entire screen, any individual window, or any portion of the screen. The file is saved as a PICT image. These files can then be printed, converted to GIF files for placement on the Web, or inserted into other documents. All images within this article were initially made with Flash-It. Figure 1 shows the general setup of this control panel.

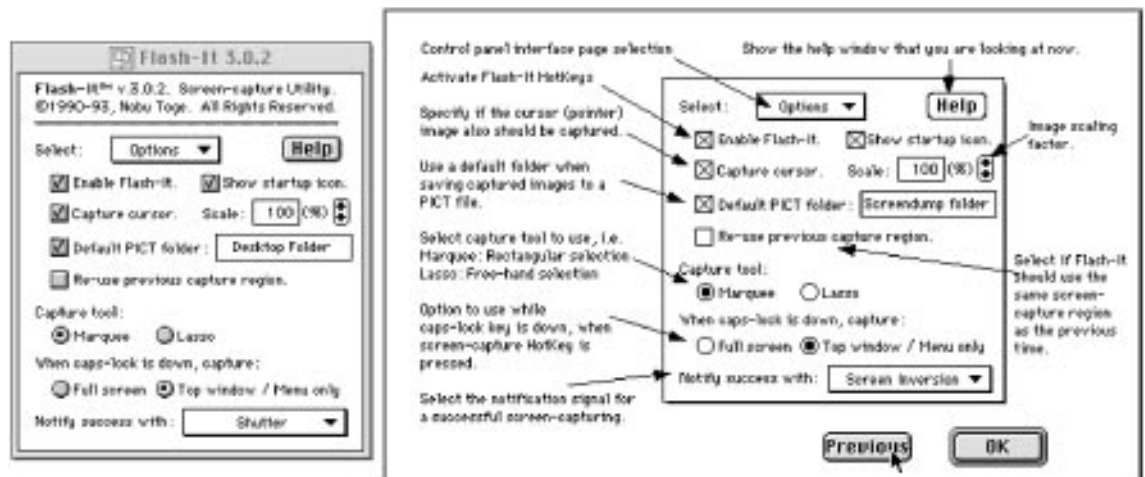


Figure 1. Flash-It Interface

Flash-It is easy to use. Drop it in your System Folder (The Mac OS should then automatically place it within your Control Panels Folder), reboot, and you are ready to go. Command Shift 3 will bring up a crosshairs cursor. Draw a box about a region and let go of the mouse. You will hear a distinctive camera shutter sound, "Snap!" that signals a successful capture and Flash-It will prompt you for a destination of the new image file. It is that easy. You can configure different keys and capture the entire screen or a single window. You can save the image as a file, leave it in the Clipboard, or direct it to a printer.

This utility excels when you are running an application that is extremely graphic oriented. For example, suppose you are using a molecular modeling program. You want to capture a quick image of the molecule you have been working on, but you would rather not produce a file that is only readable by that application. "Snap!" You now have an image like Figure 2 that you can easily insert into a Word or PowerPoint file for a publication or presentation. If you would like to use it on the Web, then you will need the next application mentioned in this article, Graphic Converter.

The current version for Flash-It is 3.0.2, and it can be found at

<ftp://ftp.amug.org/pub/amug/bbs-in-a-box/files/util/f/flash-it-3.0.2.sit.hqx>

Graphic Converter

This program is the ultimate graphics utility for the Macintosh. The number of options you have are staggering. All of the images in this article were converted from PICT to TIFF with Graphic Converter before they were sent off to the editor.

First, and foremost, Graphic Converter will read in almost any graphical format (PICT, GIF, Sun Raster, etc.) and convert the image to almost any format. There are currently 30+ graphic formats recognized by this application. Graphic Converter will do this one file at a time, or will convert entire folders at the touch of a button. This makes Graphic Converter a must for Mac users who post GIF images on the Web. Transparent GIF files are made with a click of the mouse.

Figure 3 shows the windows used by Graphic Converter. One can resize, recolor, cut and paste, and touch up images with just a few keystrokes. Slide shows, GIF animations, and graphical catalogues of folders are easily made.

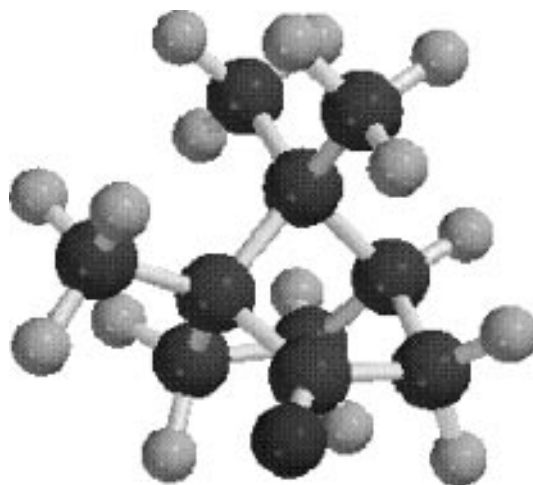


Figure 2. A Picture of Camphor Captured from MacSpartan with Flash-It!

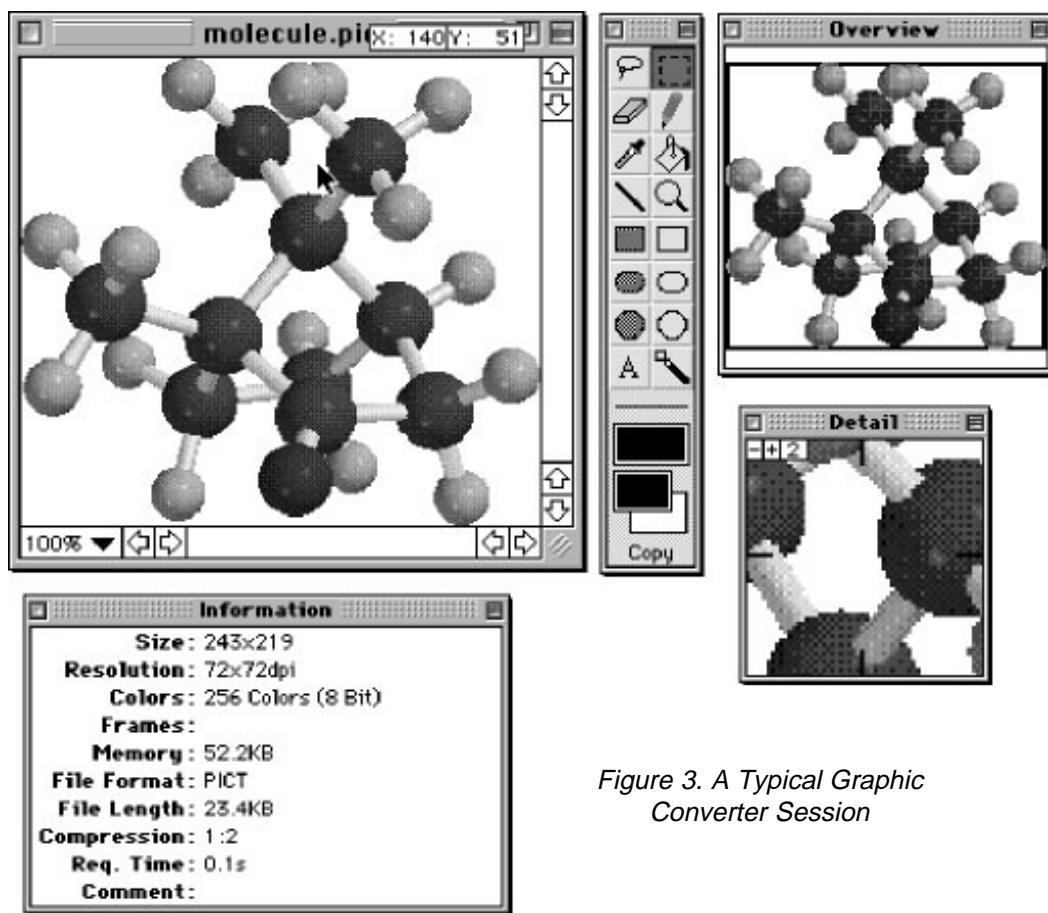


Figure 3. A Typical Graphic Converter Session

Graphic Converter will even make a file icon that is a miniature picture of the graphic within that file. This makes finding and storing graphical images much easier. The latest version of Graphic Converter is 2.4.4, and it is available at

<http://members.aol.com/lemkesoft>

Drop•PS

One of the formats that Graphic Converter will not handle is straight PostScript (PS). (Although it will read Encapsulated Postscript, EPS.) These files are self-contained bundles of information. Yet, we sometimes get stuck with documentation or graphics that are in PostScript format. For example, this is often the case with GnuPlot or CGS. Often, we would like to get a printout of these files (without having to use the unfriendly GhostScript for Mac). Drop•PS will allow you to automatically print any PostScript or EPS file directly to the printer of your choice. It is easy to use and has bailed me out of a number of tight spots when an important file I needed was PostScript only. As shown in Figure 4, the only item to set is the printer you wish the file to go to.

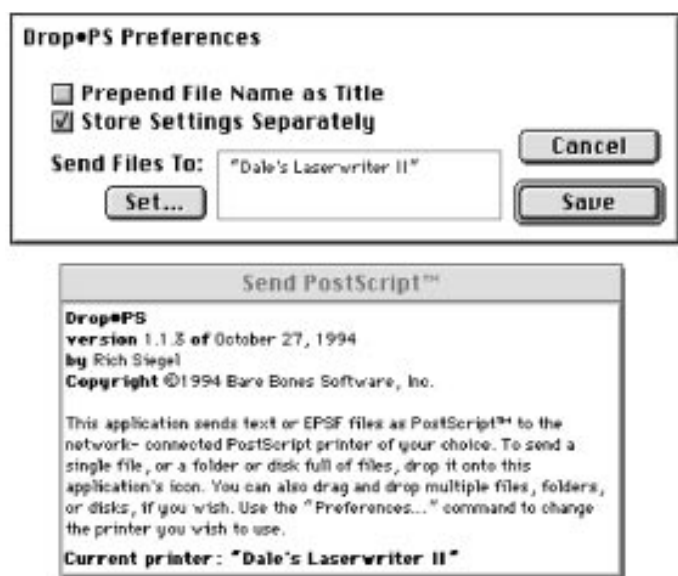


Figure 4. Drop•PS Settings

The current version for Drop•PS is 1.1.3. It is brought to you by Bare Bones, the same company that distributes the fabulous text editor, BBedit. Drop•PS can be found at

<http://www.barebones.com/freeware.html>

CalcWorks

It is difficult to get excited about a simple calculator utility. Yet CalcWorks is an exciting program. The application is an award winning scientific calculator right on you Macintosh. CalcWorks has a plethora of options and features. You can display the “tape” output of your calculations. These tapes, as pictured in Figure 5, can be saved and reopened at will, allowing you to continue or correct earlier calculations. CalcWorks stores a wide range of constants including pi, Avogadro’s number, etc. CalcWorks offers automatic conversion of number types (hexadecimal, binary, etc.), trigonometric values (degrees, radians, etc.), and even measured units (°C to °F, pounds to kilograms, etc.). If you are used to Hewlett Packard’s Reverse Polish Notation (RPN), do not fret because CalcWorks supports this input as an option.

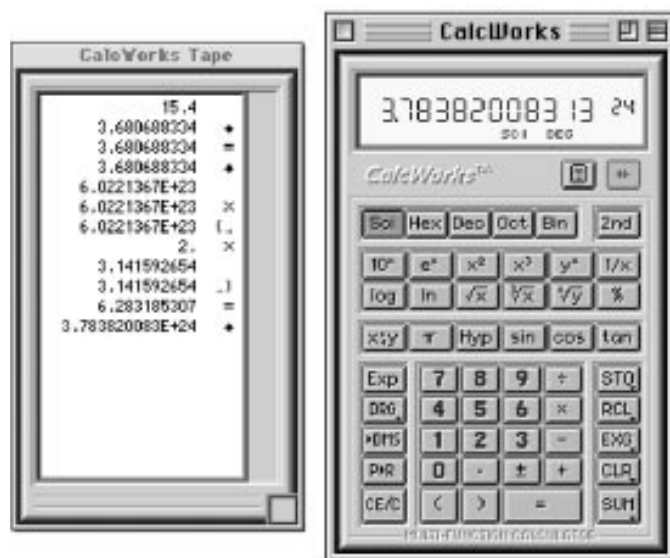


Figure 5. A CalcWorks Session

CalcWorks has an iconize feature that will put a small icon on your desktop. Need the calculator? Just click on that icon and there it is. I replaced Apple’s calculator utility in the Apple Menu Items with CalcWorks. It is just that good.

The current version is 1.5.2, and it is available for downloading at

<http://www.tiac.net/users/jbrochu>

Dale Hugo Leschnitzer, consult@lanl.gov, (505) 665-4444
ICN Consulting Office/Customer Service Group (CIC-6)

Vendor Computer Training

The Customer Service Group (CIC-6) supports vendor training in technical computing areas such as programming languages, system administration, networking, and World Wide Web development tools. The support provided by CIC-6 can be as limited as providing the appropriate facilities for a specific group or as extensive as coordinating training functions such as system administration, vendor acquisition, EDS administration, and class facilitation. The table below lists classes that are either currently being offered or are available on request. An expanded list of classes that are potentially available can be viewed on the Internet at

<http://www.lanl.gov:8010/computer-information/ComputerTraining/Vendor.html>

To request registration in any vendor course or for general assistance with vendor training, please contact the CIC-Division Vendor Training Coordinator at (505) 667-9399 or send e-mail to cic6-train@lanl.gov.

*Cost per student will vary depending on the total number of students enrolled in the class.

Course Title	Date	Time	Cost	Course Number
C Programming (Beginning)	Available on Request (5 days) \$1200-\$1700* 3996 Prerequisite(s): An understanding of and useful skills in a high-level programming language. A current ICN password is required. Topics Include: Introduction and Fundamentals; Basic Semantic Constructs - Getting; Base Level I/O With C; The Preprocess-Compilation Environment; Operators, Data Types, and Storage Classes; Control Flow Constructs; Conditional Constructs; Higher-Level Data Constructs in C; File I/O; UNIX Software Tools and POSIX System Calls.			
C Programming (Advanced)	11/18-22/96	8:30-5:00	\$1200-\$1700*	4777
	Prerequisite(s): Useful skills and experience with the C Programming. A current ICN password is required. Topics Include: Data Structures, Algorithms, and OOP; An Advanced Clinic for C ; The ANSI C Recommendation X3.159; C and ANSI C War Stories; The Data Structure and the Assessment of Algorithms; Arrays; Structures; Unions; Stacks; Queues; Linked Lists; Recursive Functions; Binary Trees; Hashing; File Organizations Using the C Runtime Library; Standard Interprocess Communication Mechanisms; and An Introduction and Overview of AT&T's C++ 3.0.			
C++ for Experienced Programmers	12/16-20/96	8:30-5:00	\$1200-\$1700*	9050
	Prerequisite(s): Excellent C Language programming skills. Topics Include: Major Differences and Additions to ANSI C; Building C++ Classes; Introduction to Text I/O with C++; Function Overloading; Single Inheritance; Virtual Functions; Multiple Inheritance; Operator Overloading; Creating, Initializing and Assigning Objects; Passing and Returning Objects; Templates, Parameterized Functions and Classes; C++Stream I/O with the File System; and C++ Course Summary.			

Course Title	Date	Time	Cost	Course Number
Perl Programming	Available on Request (1–3 days)		\$500–\$700/day*	8095/8093
Topics Include: Describes the programming language that occupies the niche between shell and C Programming; syntax and semantics; data types; operators, control flow, regular expressions, and I/O facilities; the Perl debugger.				
Perl Programming for the WWW	Available on Request (2–3 days)		\$500–\$700/day*	
Prerequisite(s): Programming skills with a light background in Perl and HTML. Topics Include: On-line Resources; Server Configuration; Permissions; Setuid Issues; Tainting; Safe Perl; Data Security; OO Programming; Web Modules; CGI Programs; CGI.pm; What Went Wrong?; CGI Template; Using Forms; Form Template; Input Widgets; Submit Widgets; Reset Widgets; Sample Form; Password Fields; Text areas; Hidden Fields; Checkboxes; Radio Boxes; Popup Menus; Lisboxes; Image Maps; Random Links; libwww Modules; Sending Mail; Shopping Carts; Database Access; and Advanced Topics.				
SGI System Administration (Beginning)	Available on Request (5 days)		\$1800–\$2300*	7993
Prerequisite(s): Familiarity with using Silicon Graphics IRIS workstations and system administration procedures on other open system platforms. Topics Include: The Role of the System Administrator; Set Up and Configuration of an IRIS Workstation or Server; Supporting a Group of Silicon Graphics Users; System Security Maintenance; Backups and Recoveries; Configuration of Disk Drives; System Installation and Application Software; Attaching Terminals and Printers; Modifying the system Start Up and Shut Down Sequences; Automating Administrative Procedures; and Performing Basic System Troubleshooting.				
SGI Network Administration	9/23–27/96	8:30-5:00	\$1800–\$2300*	11690
Prerequisite(s): Completion of Silicon Graphics System Administration (Beginning) course or equivalent knowledge and experience. Topics Include: Networking Fundamentals; Network Configuration; Network Troubleshooting; Resource Management with Network; Information Services; Domain Management with Domain Name System; Electronic Mail with Sendmail; Remote File Sharing with Network File System & Automounter; Network Performance Monitoring; and Network Security.				
SGI System Administration (Advanced)	10/21–25/96	8:30 – 5:00	\$1800–\$2300*	11689
Prerequisite(s): Completion of Silicon Graphics System Administration (Beginning) course or equivalent knowledge and experience. Topics Include: System Error Monitoring; Kernel Reconfiguration and Debugging; System Monitoring Tools; Process Management; MultiProcessor CPU Management; Memory Management and Tuning; Swap Management and Tuning; Disk Management and Tuning; XPS Filesystem Management; and System Security Concepts.				

Course Title	Date	Time	Cost	Course Number
Solaris 2.X System Administration (Beginning)	9/16–20/96	8:30–5:00	\$1600–\$2000*	7477
Prerequisite: Knowledge of Unix commands and an editor. Topics include: Custom installation of Solaris2.X server; Add peripheral devices; Use format utility to display partition information; Compress and send binary files; Change system run levels; Add startup files for additional services; Add and remove software packages; Configure terminals and modems; Administer disks and file systems; Discuss basic networking concepts; Configure NFS to support the client-server environment; Use the automounter; Add and remove diskless clients; Back up and restore file systems; Perform basic recovery and troubleshooting procedures; Configure and administer the NIS+ environment.				
UNIX (Beginning)	9/30/96–10/4/96	8:30 – 12:00	\$738	5267
Prerequisite(s): Familiarity with a UNIX workstation. Topics Include: Overview of the Workstation Environment; Getting Started; The UNIX File System; Manipulating Files; Customizing Your Environment; The C-Shell; Editing and Writing with vi; Using the Network; Discussing NFS and NIS; Using Basic System Status Commands; Startup and Shutdown Procedures; Using tar.				
Windows NT Workstation and Server	Available on Request (5 days)		\$1600-\$1900*	
Prerequisite(s): This course is valuable for personnel who are evaluating or migrating to Windows NT. It benefits system and network administrators, other support personnel, programmers, and users from Windows, Unix, OS/2, or VMS backgrounds. Topics Include: Introduction to Windows NT; System Overview and Security; Network Configuration Options; Installation; Server Choices; User Administration and Security; Files and Printers; Built-in Network Support; Configuration Options; Using Setup; Data and Disk Management; The Registry; Troubleshooting; and Optimization and Performance.				

Research Library Training

The LANL Research Library provides training for using its specialized databases. Training sessions begin and end at times indicated below. Classes are free but you must pre-register by calling the Research Desk at 7-5809 or sending e-mail to library@lanl.gov. Special classes and orientations can also be arranged.

Date	Time	Subject Matter
9/4/96	1:00-1:30 p.m.	Finding Addresses and Phone Numbers on the WWW
9/5/96	1:00-1:30 p.m.	Federal Regulations on the Internet
9/5/96	2:00-4:00 p.m.	Information Sources on the Internet via WWW
9/10/96	1:00-1:30 p.m.	NTIS (US Govt Sponsored Research)—At your desktop!
9/11/96	1:00-2:00 p.m.	Accessing LA Reports On-line
9/12/96	1:00-1:30 p.m.	1996 Chemical Abstracts on CD-ROM
9/18/96	11:00-11:30 a.m.	MELVYL (U of CA specialized databases)
9/18/96	1:00-1:30 p.m.	Finding Addresses and Phone Numbers on the WWW
9/19/96	1:00-1:30 p.m.	Energy Database—At your desktop!
9/19/96	2:00 - 4:00 p.m.	Information Sources on the Internet via WWW
9/24/96	1:00 - 1:30 p.m.	SciSearch at LANL—At your desktop!
9/25/96	1:00 - 2:00 p.m.	Accessing LA Reports On-line
9/26/96	1:00 - 1:30 p.m.	Locating Grants and Funding Information

Labwide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below and on the following pages for specific information about courses currently offered.

Course Registration

You must have a valid ICN password before taking any of the courses shown in the table. To register for a course, call the CIC-6 Training, Development, and Coordination section at 667-9559 or access our Web page. From the LANL home page, look under "Services/Computing at LANL/Training" or enter the URL:

<http://www.lanl.gov:8010/computer-information/cic6/teampage.html>

Course Title	Date	Time	Cost	Course Number
Employee Development System - Basic Training (EDS I):	9/4/96	8:30 – 12:00	\$260	Course #5289
The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.				
Employee Development System - Training Plans (EDS II):	9/18/96	8:30 – 12:00	\$260	Course #7155
Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System (course #5289).				
Eudora Electronic Mail	9/16/96	1:30 – 3:30	\$130	Course #9762
This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.				
Data Warehouse Basics	9/17/96	1:30 – 3:30	\$130	Course #11961
Students will receive hands-on training to generate standard reports and make quick queries from information in the data warehouse, a real-time collection of data tables from Laboratory financial, time-reporting, and personnel systems.				
Data Warehouse/ Financial Reporting	9/9/96	8:30 – 12:00	\$260	Course #11960
Students will receive hands-on training to generate standard financial reports and make on-line queries from information in the "data warehouse," a collection of data from Laboratory budgeting, accounting, and time-keeping systems.				

Course Title	Date	Time	Cost	Course Number
Financial Management Information System (FMIS):	Scheduled on Request		\$260	Course #8338
Participants receive hands-on instruction to “explode” and “transfer” through the costs, allocations, and outstanding commitments screens. In addition, participants will create/review reports, access the Information Manager Utility for printing reports, and learn how to assign authorities in the system.				
HTML Basics	9/12/96	1:30 – 4:30	\$260	Course #11605
Students will gain a basic understanding of HTML (Hypertext Markup Language), the language for the World Wide Web. Topics covered will be commands and standards, creating and editing documents, and authoring programs.				
HTML Tables	October	8:30 – 12:00	\$260	Course #11959
Students gain basic understanding of how to create various tables in HTML and new tags in HTML 3.0. Netscape-specific tags are also identified for clarity. Prerequisite: HTML Basics (Course #11605) or permission of the instructor.				
Introduction to the Internet: Beginning Netscape	9/19/96	1:30 – 3:30	\$130	Course #10961
Students gain basic understanding of the Internet and the World Wide Web and the use of Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.				
Lotus Notes 4.0	9/20/96	8:30 – 12:00	\$260	Course #9917
This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.				
On-Line Forms	9/19/96	3:30 – 5:00	\$130	Course #9756
Participants will learn to use Netscape software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the “ICN Validation Request,” “Visitor Request for Unclassified Visits to Security Areas,” and “Request for Quotation.”				
PCS Overview	Scheduled on Request		no charge	Course #11924
Overview of Purchase Card System. Students will have taken BUS-5’s credit card course. Call Ruby O’Rear at 665-4523 for course schedules.				

Course Title	Date	Time	Cost	Course Number
Property Accounting, Inventory, and Reporting System (Advanced)	Scheduled on request		\$260	Course #9918
This course will include a refresher of PAIRS, advanced techniques and tips, explanation of the notification system, and report capabilities. Swap Shop, Loan Out information, and support tables will be discussed. Participants should already have a basic understanding of and know how to use PAIRS.				
Purchase Card System	9/5/96	8:00 – 9:00	no charge	Course #11924
Prerequisite: PCS Overview. Students will learn to reconcile monthly statement of account, submit reconciled statement of account for approval, print statement of account for audit records, and delegate reconciliation authority.				
Reporting with Infomaker	10/10–11/96	8:30 – 5:00	\$600	Course #11054
Hands-on training to query data and develop ad hoc, or non-standard, reports from the LANL data warehouse using Infomaker software.				
Time and Effort System (GUI)	9/18/96	1:30 – 3:00	no charge	Course #11018
The student will learn how to enter attendance, amend attendance, approve attendance, and submit exception and approval reports. Time codes and associated policies will also be discussed. In addition, the student will learn how to use the Information Manager utility to view and print reports.				
Travel—New!	9/19/96	8:30 – 11:30	no charge	Course #12091
Hands-on training to submit and approve travel requests and expenses in the new Travel System which replaces the TRIPS on-line system and the post-travel expense worksheets.				

INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."

Mail your completed application to:

ICN Password Office (PWO)
Mail Stop: B271
Los Alamos National Laboratory
Los Alamos, NM 87545

If you have **questions**:

Call: (505) 665-1805
E-mail: validate@lanl.gov

All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

Owner Information

Z-Number (if you have one)	PWO Use Only	Name (last, first, middle initial)
LANL Group	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")
Phone Number	Cost Center	Program Code

Check LANL affiliation: <input type="checkbox"/> LANL employee <input type="checkbox"/> Contractor _____ (specify contract company) <input type="checkbox"/> Consultant, VSM, associate <input type="checkbox"/> External user _____ (specify employer) <input type="checkbox"/> Other (specify) _____	Send password / smartcard to: <input type="checkbox"/> Mail Stop or <input type="checkbox"/> Mail to address indicated below Name / Organization _____ Address _____ _____ City, State, Zip Code _____
--	--

Access Check access method and needed partitions:

Access method:	<input type="checkbox"/> ICN Password	<input type="checkbox"/> Smartcard	<input type="checkbox"/> Both
<input type="checkbox"/> Open partition (e.g., email systems, open machines)			
<input type="checkbox"/> Administrative partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS]) If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.			
<input type="checkbox"/> Secure partition (i.e., secure machines) Indicate level(s) of data to be processed: <input type="checkbox"/> Unclassified <input type="checkbox"/> Secret		I certify this person does require secure access: _____ Manager Signature (Group Leader or above) Date	
NOTE: A Q-clearance is required. All classified computing must be performed within the Secure environment.			

PWO Use Only

New <input type="checkbox"/>	Change <input type="checkbox"/>	Clearance Status	Processed	Lv	Smartcard Serial #
Comments:					

Special Requirements

Administrative Partition	
(U.S. Citizens Only)	Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])
<input type="checkbox"/> Under 18 years of age	If you need to access Administrative systems, your group leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Q-Cleared") section below. You may not access the Secure Partition.
<input type="checkbox"/> Contractor or Non-Cleared	Phone (505) 667-9444 to obtain Access Authorization packet. Phone (505) 667-9153 to schedule a security briefing. Bring all forms including this ICN Validation Request to the security briefing for approval.
Security Briefing Approval Signature	Date

<input type="checkbox"/> Foreign National
Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Division Director describing your need to access the ICN.

Authorization (required)

Print Manager Name (Group Leader or above)	Manager Z-Number	Group
Manager Signature (Group Leader or above)	Mail Stop	Date

If you are NOT a LANL employee, obtain your LANL contact's signature in addition to the contact's manager's signature.
NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature	Mail Stop	Date	

Reader Feedback

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Do Not Staple
Fold on This Line First



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 88 LOS ALAMOS NM

POSTAGE WILL BE PAID BY THE ADDRESSEE

MAIL STOP B251
ATTN: MIKE FINNEY, MANAGING EDITOR
CUSTOMER SERVICE GROUP (CIC-6)
LOS ALAMOS NATIONAL LABORATORY
PO BOX 1663
LOS ALAMOS NM 87544-9916



Do Not Staple, Seal with Tape
Fold Here

cut along dashed line

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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_____ Delete my name from the **BITS** mailing list.

_____ Change my name/address as indicated below.

Date

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Zip

Employee Z#

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